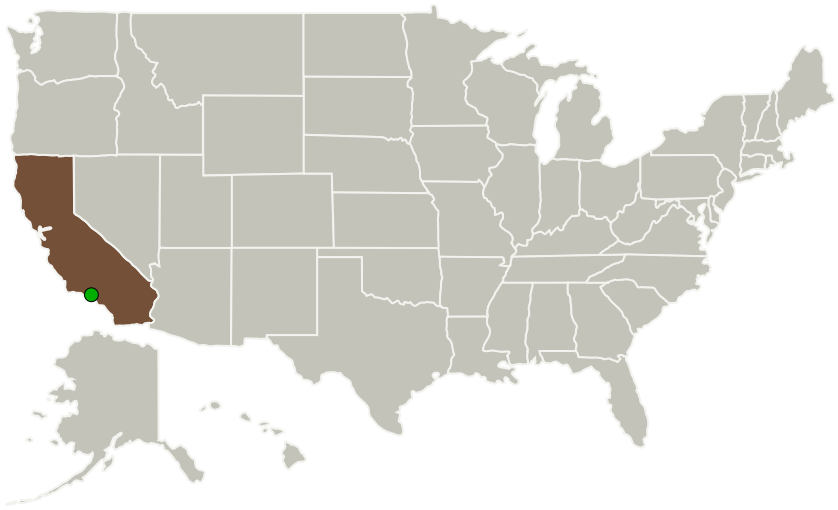
A LOX-Cooled, Pump-Fed Rocket Engine for Sample Return Applications, Phase I

Completed Technology Project (2012 - 2012)

Project Introduction

To-date, the realization of small-scale, high-performance propulsion systems for challenging in-space maneuvers requiring high delta-V and acceleration over a short period of time (i.e. sample return), has largely been limited by the lack of regeneratively-cooled thrust chamber assemblies and turbopumps in the 100-1,000lbf thrust class. Ventions proposes to overcome this limitation by developing a 500lbf, LOX-cooled, pump-fed engine for in-space propulsion applications. The Phase I effort will focus on: 1. Overall design of a 500lbf engine; 2. Detailed design and fabrication of a sub-scale, LOX-cooled main combustion chamber; and 3. Experimental hot-fire testing of a LOX / IPA combustion chamber assembly to evaluate cooling channel performance and LOX quality at the injector inlet.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Ventions, LLC	Lead Organization	Industry	San Francisco, California
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

A LOX-Cooled, Pump-Fed Rocket Engine for Sample Return Applications, Phase I

Table of Contents

A LOX-Cooled, Pump-Fed Rocket Engine for Sample Return Applications, Phase I

Completed Technology Project (2012 - 2012)

Primary U.S. Work Locations
California

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137826)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Ventions, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

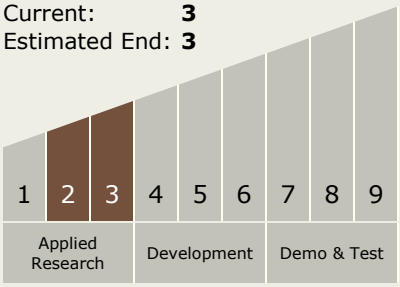
Carlos Torrez

Principal Investigator:

Adam London

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



A LOX-Cooled, Pump-Fed Rocket Engine for Sample Return Applications, Phase I

Completed Technology Project (2012 - 2012)

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.3 Cryogenic

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System